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Date: July 28, 1999
Re: Inventor(s): William J. Tiso
Title: DUAL PERSONALITY ANALOG PORT
Atty. Docket No.: 024/1

JCS18 U.S. PTO
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Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Submitted herewith is the above-identified patent application. Also enclosed are:

- 1) 2 sheets of informal drawing (Figs. 1-2);
- 2) A self-addressed, stamped return postcard; and
- 3) A check in the amount of \$760.00 payable to the "Commissioner of Patents and Trademarks."

Respectfully submitted,

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JIK/pa
Enclosures

CERTIFICATE OF MAILING

Express Mail mailing label number EL06995671US
Date of Deposit July 28, 1999

I hereby certify that this paper or fee is being deposited with the United States Postal Service *Express Mail Post Office to Addressee* service under 37 C.F.R. §1.10 on the date indicated above and is addressed to Box PATENT APPLICATION, Assistant Commissioner for Patents, Washington, D.C. 20231

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DUAL PERSONALITY ANALOG PORT

TECHNICAL FIELD

This invention relates to telephony interface equipment, and more particularly, to an improved interface connector that is software configurable.

BACKGROUND OF THE INVENTION

A prevalent type of physical interface to a telephony system is an RJ 11 port. The RJ 11 port is the common opening into which an RJ11 connector from a telephone is input. Many devices used in the telephony industry include numerous RJ11 ports and connectors.

The RJ 11 ports and connectors are utilized both to connect to the telephony systems and to connect to telephony end user equipment. As a simple example, consider a fax machine that has an additional port to which a telephone may be connected. The fax machine will typically include two RJ 11 ports, one for connecting the fax to the telephone network, and one for connecting a telephone to the fax machine if desired. In more complex equipment, there may be a large number of RJ 11 ports for connecting to end user equipment, and a large number of ports for connecting to the telephone network.

Depending upon the configuration and requirements of any particular system, it is possible that all of the RJ 11 ports for connecting to the telephone network are used up, while there are available RJ 11 connectors for connection to end user equipment. Additionally, it is possible, in consumer equipment such as personal computers, that the end user simply plugs the wrong wires into the RJ ports, connecting an end user equipment to the port that is supposed to be connected with the telephone network.

In view of the foregoing, there exists a need in the art for a more flexible and error free technique of utilizing RJ 11 ports in telephony system equipment.

SUMMARY OF THE INVENTION

5 The above and other problems of the prior art are overcome in accordance with the present invention which relates to an improved technique of facilitating use of an RJ 11 port. The inventive method and apparatus provides an RJ 11 port which is software configurable to accept connection to either an end user telephone equipment or to a telephone network. In a preferred embodiment, the software may automatically detect whether the port is connected to a telephone network or to an
10 end user equipment. The software then configures itself such that the RJ 11 port acts either as a port for connection to the telephone network, or as a port for connection to an end user equipment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

15 Figure 1 is a block diagram of the necessary hardware to implement an exemplary embodiment of the present invention. The arrangement of figure 1 includes an exemplary Codec 100, available off the shelf, connected to a DAA and SLIC interface 101 and 102 respectively. State machine controlled switches 103 operate in response to a state machine (not shown in Figure 1) in order to configure the device as either a port for connection to an end user telephony equipment ("end user port") or a port for connection to the telephone network ("network port"). Also shown
20 in figure 1 is the RJ 11 port itself, indicated at 105.

Referring to Figure 2, the preferred state is the on hook DAA state. In this state, the outside line at the RJ (105) is connected only to the voltage detection circuit 104.

While connected to a pbx or pstn, there should be loop voltage constantly present. If this voltage disappears for time T1 (e.g. 5 seconds) then it can be assumed that the connection to the PBX or PSTN has been removed. This will trigger a transition to the On Hook SLIC state S2. In this state, the port is switched to the SLIC circuit, and as a result, constantly supplies loop voltage out of the RJ 105.

In state S2, the SLIC continuously monitors port for loop current, which indicates that the end user equipment has gone off hook. The resulting transition to the off hook SLIC state is shown for clarity, but is not critical the novel aspects of the present invention.

While in state S2, the system can determine if it is connected to a PBX or PSTN. If this occurs, then the system must be reconfigured so that the port 105 behaves like a DAA port. To facilitate this decision, an interval timer T2 is used to periodically isolate the loop voltage being supplied by the SLIC circuit from the loop voltage detector 104. The duration of this isolation is time T3, and exemplary value of which could be 50 ms. T3 must be long enough to detect external loop voltage but short enough to minimize the removal of loop voltage to a connected end user equipment. If external loop voltage is detected, a transition to state S1 occurs and the port is thereby reconfigured to that of a DAA.

It is also possible to configure the remainder of any circuit card to which the system is connected so that the RJ 11 port is connected to different components depending upon whether it is configured as a DAA or a SLIC. In a simple example, a board may have only one DAA port and one SLIC port at any time. Such an arrangement would exist with respect to a standard inexpensive modem for use with a personal computer. If the SLIC port is accidentally plugged into the PSTN, the board could automatically reconfigure that port and connect it to the electronics for receiving

signals from the telephone line. Additionally, the system could also automatically reconfigure the remaining port to become the SLIC port. In this manner, a user end not worry about into which port he or she plugs the wire connecting the system to the PSTN.

While the above describes the preferred embodiment of the invention, various other
5 modifications and enhancements will be apparent to those of skill in the art. Such enhancements are intended to be covered by the following claims.

WHAT IS CLAIMED:

1. Apparatus for interfacing to a telephone line comprising:
an RJ 11 port;
means for automatically determining whether an RJ 11 connector inserted into said port is
connected to an end user equipment or to network equipment, and
means responsive to said means for determining for automatically configuring said port to
interface to either an end user equipment or a telephone network.
2. Apparatus of claim 1 wherein said RJ 11 port resides on a circuit card, said circuit card
having electronics for interfacing to end user equipment and a telephone network, and a
switching matrix responsive to said means for automatically determining that selectively
switches the electronics for interfacing to the telephone network or to the end user
equipment.
3. A method of processing a signal produced by an RJ 11 connector inserted into an RJ 11 port,
the method comprising the steps of detecting whether the connector is attached to a telephone
network or to an end user equipment, and, in response thereto, connecting different
electronics to said port.
4. An RJ 11 port control apparatus comprising:
means for monitoring the presence of loop voltage, and for detecting if said loop voltage
ceases to be present for a predetermined time;
means for supplying an output voltage if said input voltage ceases to be present after a
predetermined time.
5. Apparatus of claim 4 wherein said predetermined time is approximately five seconds.

ABSTRACT

An RJ 11 port is disclosed that detects the device to which it is connected and automatically reconfigures itself as end user equipment or network interface equipment.

Figure 1.

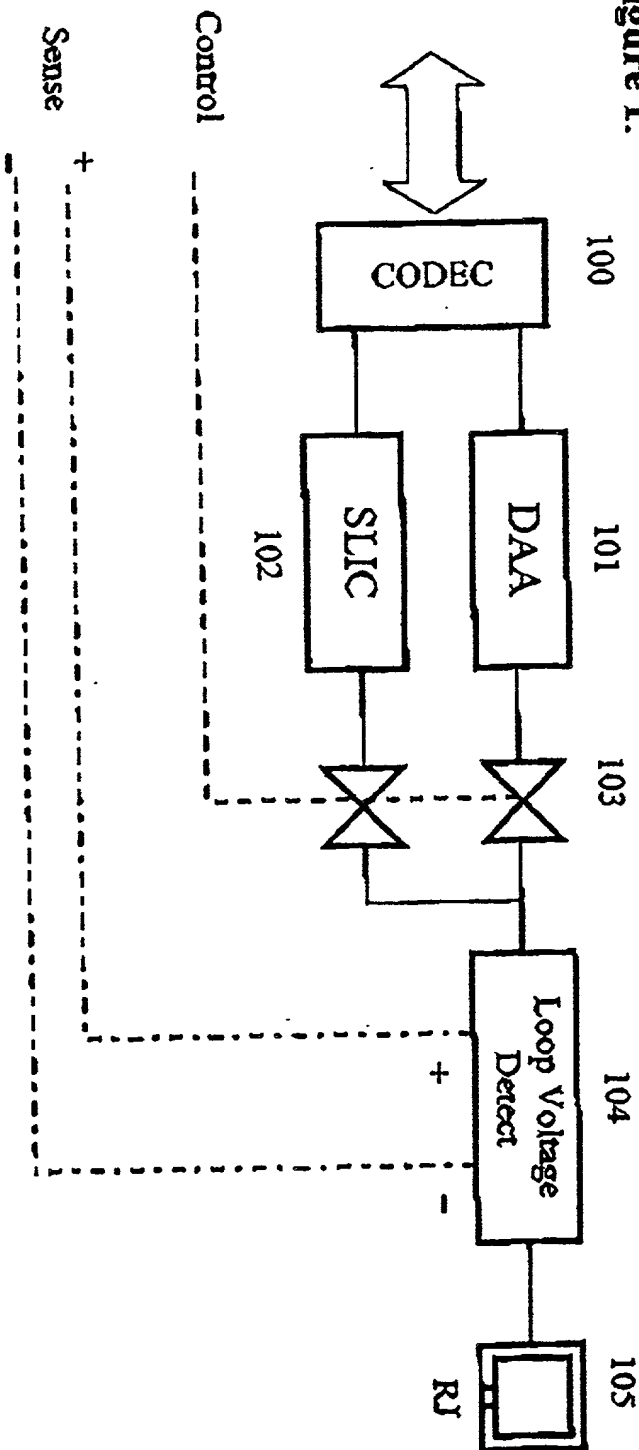


Figure 2.

